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Respiratory Syncytial Virus Infection among Children under 2 Years Old in Hillah City, Iraq

Ali Hussein Al-Marzoqi[1*] (Corresponding author), **Zahraa** Mohammad Al Taee[2] and **Hussein** J. Hussein [3]

1. College of Science for women, Babylon University, PO box 435, Al-Hillah city, Babylon, Iraq. Tel: 009647710336121 E-mail: ali_almarzoqi@yahoo.co.uk
2. College of Science, Babylon University
3. College of Science for women, Babylon University

* E-mail of the corresponding author: ali_almarzoqi@yahoo.co.uk

Abstract:
Objective: To reveal the respiratory syncytial virus (**RSV**) associated with lower respiratory system infections (LRI) in children under 6 years old.
Methods: RSV antigen was detected in the children aged less than 2 years by enzyme-linked immunosorbent assay (ELISA), performed on nasopharyngeal specimens from children admitted to children and maternity hospital in addition to those who came to outer clinic in Al-Hillah city, Iraq.
Results: Among children aged < 2 years, the incidence of RSV-associated LRI per 350 child-years was 68 positive cases. The majority of RSV cases occurred in infants.
Conclusion: This study demonstrates that RSV contributes to variable burden of LRI in children aged < 2 years in Al-Hillah city, Iraq. The probable descriptions for this deviation are social factors, patterns of seeking health care and differences in clinical characterizations used for obtaining samples. The age distribution of cases indicates the need for an RSV vaccine that can protect children early in life.
Keywords: Respiratory syncytial virus (RSV); Respiratory tract infections (RTI); Infant.

Introduction

Respiratory tract infections due to respiratory syncytial virus (RSV) are very common in young children worldwide. In temperate climates the infection occurs in yearly winter epidemics, and by two years of age most children have been infected [1]. The role of viruses in the causation of acute lower respiratory infections (LRI) in developing countries was systematically examined almost 20 years ago in a series of studies sponsored by the Board on Science and Technology for International Development (BOSTID) of the United States National Academy of Sciences [2].

In these studies, which encompassed both community-based and hospital-based surveillance, respiratory syncytial virus (RSV) was identified as the predominant cause of LRI in children who were aged < 2 years. However, only two of the BOSTID studies both from the Americas were denominator-based and thus addressed the impact of RSV [3, 4].

Recent reviews of the epidemiology of RSV in developing countries [5, 6] have identified few additional denominator based studies that examine the role of RSV in causing severe LRI, despite the fact that RSV is the most common viral cause of LRI. Globally, only six studies provide information on the incidence of LRI caused by RSV among children in developing countries; however, these studies did not assess RSV impact in the same age groups, did not use the same diagnostic methods, and one carried out only a few months of surveillance [7].

Recognizing that there was scant recent evidence for the role of RSV in causing LRI among children in developing countries, WHO recommended that new studies be undertaken in developing countries and developed a standardized protocol. The objectives of the protocol are to determine the age-specific incidence of RSV-associated respiratory infections in children < 2 years of age, assess the severity of acute respiratory infections due to RSV, and determine the seasonal variation of infections [8].

Reinfections are common throughout life but the first infection is usually the most severe [9]. Symptoms vary from a mild upper respiratory tract infection to a severe bronchiolitis with hyper inflated lungs and hypoxemia [10]. Children in the first months of life, particularly those with preterm birth, underlying chronic lung disease (CLD), congenital heart disease (CHD), neuromuscular disease, airway malformations or impaired cellular immunity are at risk for severe disease [11]. The aims of the present study were to identify risk groups, outcome and incidences of hospitalization for RSV infection in Babylonian children less than six years of age, and to compare these results with other studies.

Methods

The Pediatrics Department at children admitted to children and maternity hospital is the only hospital for children in the area, except for pediatric surgery. The infants and children are admitted to our hospital in case of disease during childhood. The number of children less than two years of age living in the service area at any time during the follow-up period was identified using ELISA technique; RSV IgM (Respiratory syncytial virus) (DRG-USA). The number of children in the general population was not known in the present study and hospitalization incidences could therefore not be estimated. Overall mortality after the neonatal period as well as the number of children moving out of the service area during the study period were low and have not been corrected for.

Results and discussion

RSV Viruses were isolated and identified in 19.43% of the children included in the study as sole infectious agents and viral infection associated with bacterial infection formed 12.57% as co-infection with bacteria (table 1). These results reveal that viral infection predominated in RTI, which agrees with reports by other authors [12, 13 and 14] who mention that between 20 and 90% of RTI are caused by viruses. In relation to age, we expected to find a higher frequency of both total viruses and RSV in children younger than 1 year of age however, it is known that the frequency of this virus is higher in younger children, in which it is overwhelming. RSV showed the highest percentage (30.62%) in group children of 10 to 14 months of age. We presume that this is because these children attend kindergarten and are in daily contact with other children and, even if they have antibodies, these may not be enough to protect them against re-infections from different strains of the virus. We expected to achieve the largest number of positive isolations in children younger than 2 year of age. We observed that the largest number of cases and virus isolations was present in the winter. During eighteen months period 350 children were hospitalized for viral and bacterial infections. 19.43% (68 children) had hospitalization for RSV bronchiolitis and pneumoniae during the first two years of life. The highest number of admissions was recorded during the winter months November-January (figure 1).

Earlier studies showed that RSV prevalence was found to be more in males than females and that is agreed with our study (table 2) [15] and male gender was considered an independent risk factor for the development of severe RSV infection. In contrast, the authors observed an equal distribution of RSV in boys and girls though association with younger age was similar to that reported elsewhere [16].

In conclusion, generally hospitalization incidences and outcome of RSV bronchiolitis and pneumonia were in agreement with other studies, hospitalization incidences for preterm children were nearly same as many other studies. Age on admission for children was comparable to low-risk children.

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Table 1: distribution of the positive and negative results of the RSV infection among Children

	No.	%
Negative results	282	80.57
Positive results	68	19.43
Total	350	100.00

Table 2: distribution of the RSV infection among Children related to Gender

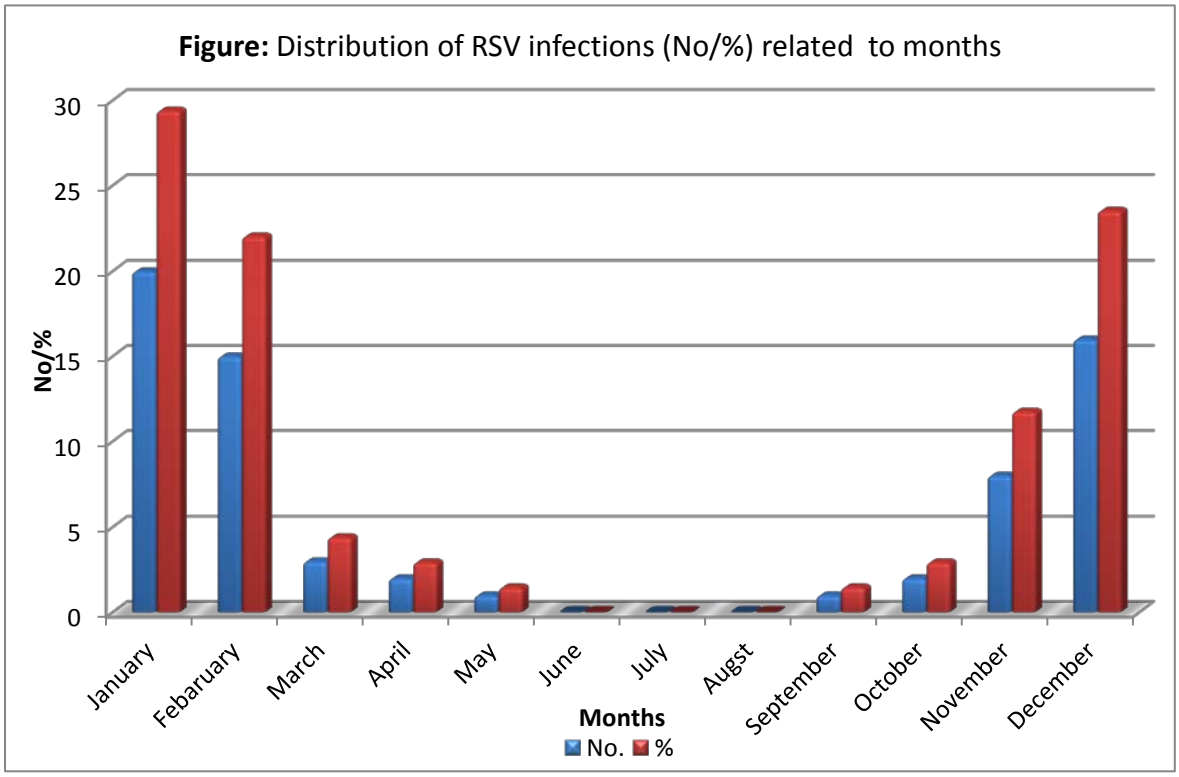
Gender	No.	%
Male	112	53.59
Female	97	46.41
Total	209	100.00

Table 3: distribution of the RSV infection among Children related to Age

Months	No.	%
One-Four	19	9.09
Five-Nine	40	19.14
Then-Fourteen	64	30.62
Fifteen-Nineteen	32	15.31
Twenty-Twenty four	54	25.84
Total	209	100.00

Table 4: distribution of the Bacterial, Viral and mixed infection among Children included in this study

Type of causative	No	%
Viral infection	209	59.71
Bacterial infection	97	27.71
Mixed	44	12.57
Total	350	100.00



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